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AUGUST 7, 1989

CHEMICAL & ENGINEERING

NEWS

Rohm & Haas expanding operations in Europe
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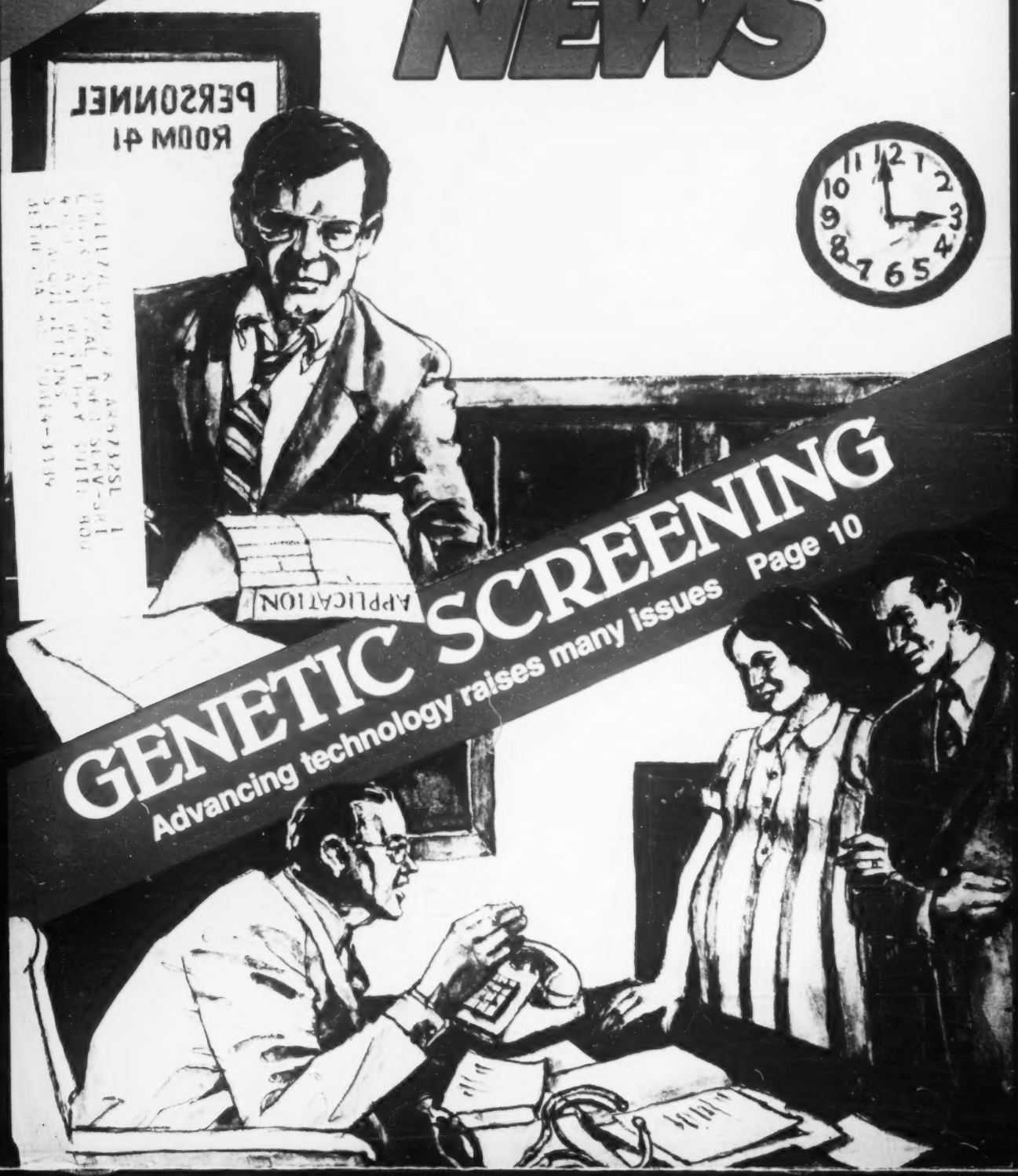

GENETIC SCREENING

Advancing technology raises many issues

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CHEMICAL & ENGINEERING
NEWS
Volume 67, Number 32
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AUGUST 7, 1989

News of the Week

■ **Powerful Senator's anger at research porkbarreling has turned into amendment that may crimp lobbying practices.** **Page 4**

■ **Italy's Montedison offers more than $1 billion for the stock it does not already own in U.S.-based operations of Himont and Erbamont.** **Page 5**

■ **Department of Energy proposes five-year plan for waste cleanup at its nuclear facilities.** **Page 5**

■ **U.S. government grants Akzo Chemicals exclusive license to implement bulk process that stops deterioration of books printed on acidic paper.** **Page 6**

■ **Oil, Chemical & Atomic Workers Union helped stall startup of BASF plant in Geismar, La.** **Page 6**

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President Bush's clean air bill receives mixed reviews from Congress and environmentalists. **Page 26**

Science/Technology

Carnegie Mellon researchers synthesize new tin-based propellane that may shed light on bonding questions as well as prove useful for fabricating advanced materials. **Page 29**

Seiko Mead Co. introduces full-color copying system that features a photographiclike, film technology that does not use silver halide. **Page 32**

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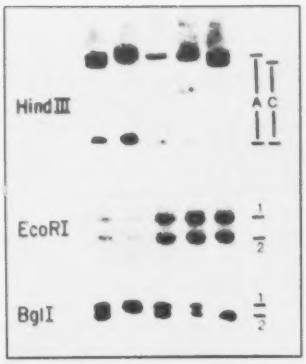

News Focus

Advances in genetic screening for defects that cause a variety of disorders may improve health care, but raise legal and ethical questions. **Page 10**

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LETTERS

Cheemotherapy entrenched

SIR: A. G. Engstrom (C&EN, June 12, page 2) has brought up cheemotherapy vs. chemotherapy again. When someone makes a clear mistake in pronouncing a chemical term, I agree that they should be made aware of it.

However, the pronunciation "cheemotherapy" is so firmly entrenched (Webster's Ninth New Collegiate Dictionary lists it first) that attempts to correct it would risk being viewed as parochial or egocentric. What we need today is fewer barriers to communication, not more. Loosen up, guys.

Robert Riesenman
Hammond, Ind.

SIR: Referring to the recent letters expressing concern over the mispronunciation of words derived from or relating to chemistry, my wife chuckled, "Don't chemists realize that the entropy factor may apply equally well to linguistics?" If so, we may be able to alter the rate at which mispronunciations evolve into common usage by applying the "scholarly influence" suggested by A. G. Engstrom, but we cannot stop the process.

Perhaps those who are concerned about the pronunciation of cheemotherapy should apply their energies to more important issues such as global warming (which, as its influence on the entropy term in Gibbs' free energy expression suggests, may be accelerating the deterioration of our language) and let my wife have the last laugh—as is her custom.

Albert L. Powers
Chairman, Science Department
Concord-Carlisle High School
Concord, Mass.

Material safety data sheets

SIR: I am pleased to see at last some interest and controversy being expressed in C&EN regarding the adequacy, or inadequacy, of material safety data sheets (C&EN, March 20, page 4; May 29, page 2). As every chemical professional knows (or should know), the material safety data sheet is the cornerstone of the Occupational Safety & Health Administration's Hazard Communication Standard (29 CFR 1910.1200).

For the past three years, I have been working in the area of chemical safety for a large, non-CPI company, and have become very familiar, if not always happy, with the care and feeding of hundreds of vendor material safety data sheets (since we do not prepare any of our own, we are dependent on those from our various chemical suppliers).

From this recent experience, two aspects of data sheets in general have concerned and frustrated me in my administration of the Hazard Communication Standard in the workplace. For some unknown reason(s), the format of the material safety data sheet was never mandated by OSHA. Both the older Form 20 and the revised Form 174 were recommended for use, but only the informational content was made requisite. Try submitting your federal income tax return on a form marked "essentially similar to Form 1040"! The net result of this laissez-faire situation is that material safety data sheets are published in dozens of formats, ranging from very complete four- to eight-page dissertations to two-page useless brevities, and it's confusing, at best, when one has to review many data sheets to find all the information one needs, under widely varying headings.

This confusion with format also makes it very difficult for emergency response personnel to find crucial information rapidly under demanding circumstances. In addition, now that computerized text readers are becoming more widely available, a standardized material safety data sheet format would be most useful for filing and retrieval purposes.

One could write a book about the broad spectrum of the quality of material safety data sheet information. As a corollary of the format problem, it follows that the longer data sheets generally contain much more complete chemical information than the shorter ones. However, many of the data sheets that I have reviewed are not worth the paper they're printed on, and very few comply with all of the information requirements of the Hazard Communication Standard [Paragraph (g)]. I am not aware of any OSHA policing activity in this area of Hazard Communication Standard compliance, but perhaps more attention should be paid to enforcing the requirements for material safety data

Correction

• July 17, page 24: The research leading to production of diamond powder using a microwave plasma was a collaborative effort involving Michael Frenklach, professor of fuel science at Pennsylvania State University, and Richard J. Koba, material scientist at Diamond Materials Inc., State College, Pa., along with Penn State ceramic science and engineering program chairman Karl E. Spear.

Superconductivity industrial consortia explored

Cooperative programs among industry, academia, and government often are advocated as a route to improve U.S. commercial competitiveness in high-temperature superconductor technologies. However, although a few consortia have been formed (C&EN, July 10, page 19), an industrial base is not yet established. The Defense Advanced Research Projects Agency (DARPA), created 30 years ago by the U.S. Department of Defense (DOD) to accelerate the development of new technologies, has surveyed industry to determine if an initiative on the manufacture of high-temperature superconductor products holds any promise.

DARPA's survey included questions on the planning of and participation in industrial consortia, government sponsorship of R&D, directions for R&D and manufacturing, and a plan for DOD involvement in high-temperature superconductor consortia. The results of the survey, based on the responses of corporate officers from 48 companies involved with high-temperature superconductivity, were compiled in a recently released report.

Kay Rhyne Adams, DARPA program manager for ceramics and superconductivity, states in the report that most U.S. companies, unlike Japanese companies, are taking a "wait-and-see attitude" toward manufacturing. Major U.S. corporations, such as IBM, AT&T, Du Pont, and Hewlett-Packard, do not have any near-term plans for manufacturing, the report adds, despite having extensive research programs. DARPA indicates that even those companies participating in its programs are "holding back." Thus, it appears that only smaller startup companies are moving toward near-term production.

However, 71% of the respondents believe that the technology is not too young to begin planning for an industrial base to support production. In fact, 94% indicated that they would consider being part of a government-sponsored consortium for superconductivity. Government sponsors are generally considered more desirable than private sponsors. In choosing between government agencies as potential sponsors, DARPA was rated the highest, preferred by 64% of the respondents, and the Department of Commerce, Department of Energy, and National Science Foundation followed with 22%, 18%, and 12%, respectively.

A proposal for an industrial-consortium such as Sematech's, which was created to bolster an existing semiconductor industry, was included in the DARPA questionnaire. The plan consists of three phases: funding companies through R&D contracts for two years while preparing a detailed plan for a high-temperature superconductivity consortium; establishing the consortium and a manufacturing infrastructure over a six-year period, moving toward production capabilities for electronic applications; and, continuing and moving the consortium's efforts toward high-power applications.

DARPA has an active materials- and device-oriented R&D program in high-temperature superconductivity, funded at an annual level of about $30 million. In 1988, the program included contracts with 24 companies, six government laboratories, six universities, and 23 subcontractors. DARPA and DOD have interests in advancing the technology and positioning U.S. industry to produce products that can be used in military systems. In the consortium plan, one role played by DOD would be as a small, but reliable, market for products. Products based on thin film technology are hoped for within the next three to five years with prototype production based on bulk materials by 1994.

The overall reaction by industry to the proposal is favorable. A large majority, 73%, indicate both that a manufacturing consortium is needed and that the DARPA plan looks promising. However, industry comments suggest that the focus not be on military products alone. Most all agree that there is a need for the government to establish tax advantages, in the form of incentives for R&D or capitalization, for the development of high-temperature superconductivity technologies.

Despite difficulties and uncertainties concerning new superconducting materials, two thirds of the surveyed group do not consider the technology too immature to plan for building a manufacturing effort. Not surprisingly, the percentage of responses strongly in favor of the consortium approach corresponds very closely to the number of companies in the group already in consortia or collaborative R&D programs.

Responses to the survey stress some of the not unfamiliar issues that would arise in planning a consortium. These include evaluating materials, defining and prioritizing potential applications and products, continuing R&D efforts in material fabrication and processing, device development, and manufacturing science. In addition, the corporate officers believe that further thought is required to determine how a consortium would actually be funded, implemented, and operated. A large-scale integration of government, industry, and academia has not yet been attempted in the U.S.

The report also concludes that, although the desire and need for a consortium exists, Sematech may not be the appropriate model. It concentrates on competitiveness and manufacturing. In comparison, some believe that high-temperature superconductors are primarily in the research, not commercial, stage, and that discussions of manufacturing may be premature.

Ann Thayer

Industry supports consortia on superconductivity

Total: 51 respondents to DARPA survey

Source: Defense Advanced Research Projects Agency report "Industrial Consortia for High Temperature Superconducting Technology"